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TRANSMITTAL LETTER (General - Patent Pending)	Docket No. 200-0665

In Re Application Of: **Joseph G. Walacavage et al.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/965,904	September 28, 2001	J. Proctor	33481	2123	4251

Title: **METHOD OF LOGICAL MODELING OF OPERATOR INTERACTION WITH PROGRAMMABLE LOGIC CONTROLLER LOGICAL VERIFICATION SYSTEM**

COMMISSIONER FOR PATENTS:

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Reply Brief (in triplicate), and return postcard.

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Dated: **December 18, 2007**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Art Unit: 2123

Examiner: J. Proctor

Applicant(s): J. G. Walacavage et al.

Serial No.: 09/965,904

Filing Date: September 28, 2001

For: METHOD OF LOGICAL MODELING OF OPERATOR INTERACTION WITH PROGRAMMABLE LOGIC CONTROLLER LOGICAL VERIFICATION SYSTEM

REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This Reply Brief is directed to new points of argument raised in the Examiner's Answer dated October 18, 2007 for the above-identified application. On pages 9 and 10 of the Examiner's Answer, the Examiner argues that, where the operator loads or unloads a part from a machine, it is Appellants' example of the claimed "asynchronous operation" and that Appellants' specification teaches an operator loading or unloading a part is performed by first starting a timer and subsequently timing the duration of the asynchronous operation. Further, on page 11 of the Examiner's Answer, the Examiner argues that the Schruben reference clearly teaches the claimed "asynchronous operations" as described by Appellants' specification because the machine randomly becomes jammed and the repair procedure is modeled by requiring a random amount of time and these events are not rigidly scheduled as part of the normal operating procedure, but

instead occur randomly for the specific purpose of modeling what Appellants' call "asynchronous" behavior. In addition, on page 13, the Examiner argues that it would have been obvious to that person of ordinary skill in the art that a PLC controlled machine described by the Banks reference should be tested as early as possible, and as taught by Schruben, both the sequential and "asynchronous" operations of the system should be tested.

Appellants respectfully disagree with the Examiner as to the above arguments. As to the first argument, the Examiner argues that, where the operator loads or unloads a part from a machine, it is Appellants' example of the claimed "asynchronous operation" and that Appellants' specification teaches an operator loading or unloading a part is performed by first starting a timer and subsequently timing the duration of the asynchronous operation. On page 3 of the specification, under the Description of the Related Art, Appellants state that "sequential operation" is "where the operator functions as an integral part of the sequential cycle of the workcell, thereby causing certain logic conditions to be set in the PLC logic (ex: loading/unloading a part each cycle)" and "interrupt or exception behavior" is "where the operator responds to asynchronous requests for the workcell. The premise in building the workcell model for simulation is that a user of a PLC logic verification system can perform all the necessary asynchronous functions without undue burden (for example, placing the machine into auto cycle)." Contrary to the Examiner, where the operator loads or unloads a part from the machine, it is an example of "sequential operation" and not "asynchronous operation". The specification does not state that an operator loading and unloading a part or performing it by first starting a timer and subsequently timing the duration is "asynchronous operation". On the contrary, interaction of an operator in a workcell comprises both sequential operations and asynchronous operations with the asynchronous operations not being time dependent. Therefore, it is respectfully submitted that the Examiner has misinterpreted Appellants' specification and the rejection under 35 U.S.C. § 103 is clearly wrong.

As to the second argument, the Examiner argues that the Schruben reference clearly teaches the claimed "asynchronous operations" as described by Appellants' specification because the machine randomly becomes jammed and the repair procedure is modeled by requiring a random amount of time and these events are not rigidly scheduled as part of the normal operating procedure, but instead occur randomly for the specific purpose of modeling what Appellants' call "asynchronous" behavior. However, in Schruben, these are discrete event simulations, which are time based, that cannot account for asynchronous operations. For example, the (random) time required to repair a jammed machine is modeled as a discrete or time based event because it is denoted by "t" and, therefore, cannot be an asynchronous operation. The passages from the Schruben reference cited by the Examiner do not constitute interaction of an operator in a workcell wherein such interaction comprises sequential operations and asynchronous operations, the asynchronous operations being not time dependent. In Schruben, an operator may be responsible for loading and unloading parts that are processed by a machine as well as freeing a jammed machine, but this operator interaction is not modeled by a flowchart. Contrary to the Examiner's opinion, Schruben merely discloses that an event graph can be used to develop alternative event-oriented representations of a system in which several candidate model structures can be considered for possible implementation as discrete-event simulations using an event-scheduling approach. However, Schruben does not teach of a level of skill in the programmable logic controller art of constructing a flowchart that describes interaction of an operator in a workcell wherein such interaction comprises sequential operations and asynchronous operations, the asynchronous operations being not time dependent. Therefore, it is respectfully submitted that the Examiner has misinterpreted the Schruben reference and the rejection under 35 U.S.C. § 103 is clearly wrong.

As to the third argument, the Examiner argues that it would have been obvious to that person of ordinary skill in the art that a PLC controlled machine described by the Banks

reference should be tested as early as possible, and as taught by Schruben, both the sequential and "asynchronous" operations of the system should be tested. There is no factual basis in the references relied upon which supports the Examiner's argument.

A rejection based on 35 U.S.C. § 103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the Examiner has the initial duty of supplying the factual basis for the rejection he advances. He may not, because he doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F.2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967).

Banks merely discloses a handbook of simulation in which an entity can be dynamic in that it "moves" through the system, verification of an operational model, and validation of the conceptual model being an accurate representation of the real system. Banks lacks constructing a flowchart that describes interaction of an operator in a workcell using a computer wherein such interaction comprises sequential operations and asynchronous operations, the asynchronous operations being not time dependent, and modeling the operator as an input to a programmable logic controller (PLC) by writing a control model of the operator interaction in the workcell based on predefined conditions described in the flowchart. Banks also lacks testing the control model by a PLC logical verification system on the computer as to whether PLC logic for the workcell is correct and loading the PLC logic in the PLC controlling the workcell if the PLC logic for the workcell is correct. In Banks, there is no logical modeling of operator interaction with a programmable logic controller logical verification system and there are no asynchronous operations of the operator. Also in Banks, there is no modeling of an operator as an input to a programmable logic controller (PLC). Further, Banks is not used to debug PLC logic.

The Examiner, based on speculation, states that it would have been obvious to one of ordinary skill in the art to use Schruben to modify Banks to have a PLC controlled machine

described by Banks tested as early as possible, and as taught by Schruben, both the sequential and "asynchronous" operations of the system. The Examiner's stated conclusion of obviousness is based on speculation and hindsight reconstruction of the claimed invention. One of ordinary skill in the art would not look to Schruben or Banks for guidance because neither reference teaches a constructing a flowchart that describes interaction of an operator in a workcell using a computer wherein such interaction comprises sequential operations and asynchronous operations, the asynchronous operations being not time dependent, modeling the operator as an input to a programmable logic controller (PLC) by writing a control model of the operator interaction in the workcell based on predefined conditions described in the flowchart, and testing the control model by a PLC logical verification system on the computer as to whether PLC logic for the workcell is correct. The CAFC has held that "[t]he mere fact that prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification". In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). The Examiner has failed to show how the prior art suggested desirability of modification to achieve Appellants' invention. The claimed method for logical modeling of operator interaction with a programmable logic controller logical verification system allows a user to verify that the PLC code being planned will work as intended, prior to physically building the tools/manufacturing line and locating equipment. Unlike the prior art, the focus of the present invention is on the logical representation of the operator and not the visual or spatial representations of the operator. Contrary to the Examiner, this is reflected in the claim language because it recites the step of modeling the operator as an input to a programmable logic controller (PLC) by writing a control model of the operator interaction in the workcell based on predefined conditions described in the flowchart. Further, the additional claim language of "the asynchronous operations being not time dependent" was stated by the Examiner in the Advisory Action to overcome the Schruben's reference description of randomly occurring events by explicitly excluding any "time

dependence" for "asynchronous operations". There is no suggestion or motivation to modify or combine the references to obtain this combination and the claimed combination is not obvious to one skilled in the art. Therefore, it is respectfully submitted that the rejection under 35 U.S.C. § 103 is clearly wrong.

Accordingly, it is respectfully requested that the rejection of the pending claims be reversed and that the claims pending in the present application be allowed.

Respectfully submitted,

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